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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,955	06/26/2003	Justin K. Brask	42P16001	3040

8791 7590 07/18/2005

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EXAMINER

BARRECA, NICOLE M

ART UNIT PAPER NUMBER

1756

DATE MAILED: 07/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/607,955

Applicant(s)

BRASK ET AL.

Examiner

Nicole M. Barreca

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 7-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election of Group I, claims 1-6 in the reply filed on 5/31/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 7-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5/31/05.

Claim Objections

3. Claim 4 is objected to because of the following informalities: the claim recites "indium intiminide". Was this meant to be indium antiminide? Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kump (US 3,767,493).
6. Semiconductor 10 (first layer) is formed with source and drain regions 12 and 14. Protective oxide layer 16 (second layer) is formed, followed by etch resistant mask 18 (third layer). Etch resistant mask 18 is a material such as a photoresist which is

Art Unit: 1756

exposed and developed to define the area. Protective oxide layer 16 is not completely etched through in a single etching step. Only a predetermined thickness equal to a substantial thickness of layer 16 is etched, leaving a thin layer 24 of protective oxide over surface 22. This thin layer is used to prevent any contaminants carried by the photoresist mask 18, the etchant or removal solvent from being deposited on, absorbed by or diffused into the semiconductor 10 at surface 22. Retained layer 24 is relatively thin, about 100-400 angstroms. Mask 18 is entirely removed. Since retained layer 24 protects the surface 22, the choice of solvents used to remove the mask is not limited to those which will not affect the surface 22. After the mask has been removed the surface of layer 16 is cleaned using any cleaning method well known in the art. The entire surface of the substrate is subjected to an etchant to completely etch through layer 24 to expose surface 22 (col.3, 26-col.4,68). The method may be used to etch more than one layer. Control of etch time and rate may be provided (col.5, 8-54).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kump.

9. Kump is silent on the original thickness of the protective layer and does not explicitly disclose that the second thickness is approximately 10%-25% of the first

Art Unit: 1756

thickness, or that removing a substantial portion of the second layer includes a timed etch which removes 75%-90% of the second layer. The reference however does teach etching a substantial thickness of a second, protective layer through an opening, leaving a thin unetched portion of this layer of about 100-400 angstroms and that it will be obvious that it may be desirable to initially start off with a thicker structure. Kemp also teaches control of the etch time and rate may be provided to insure that the desired depth is accurately reached (col.5, 40-54). It would within the ordinary skill of one in the art to determine the optimal (first and second) thickness of the second layer by routine experimentation and to have a second thickness of approximately 10%-25% of the first thickness, or that removing a substantial portion of the second layer includes removing 75%-90% of the second layer, if required, because the thickness of the second layer is a result-effective variable, as taught by Kemp and the discovery of an optimum value of a result effective variable is ordinary within the skill of the art, as taught by *In re Boesch*, (617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kemp as applied to claim 1 above, and further in view of Pleshko (US,3,609,414) and Rostoker (US 5,759,921).

11. Kemp is silent on the specific semiconductor (10) material and does not disclose that the first layer is a germanium material. Pleshko teaches that known semiconductor materials include silicon, germanium or gallium arsenide (col.6,2-4). It would have been obvious to one of ordinary skill in the art that the semiconductor in the method of Kemp includes silicon, germanium or gallium arsenide because Pleshko teaches that these

Art Unit: 1756

are known semiconductor materials. Kemp teaches using an oxide for the second, protective layer and does not disclose that this layer is nitride. Rostoker teaches using oxide or nitride to protect an underlying semiconductor material during an etch (col.7, 29-44). It would have been obvious to one of ordinary skill in the art to use nitride for the second, protective layer in the method of Kemp because Rostoker teaches that either oxide or nitride is used to protect an underlying semiconductor material during an etch.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kemp as applied to claim 1 above, and further in view of Pleshko.

13. Kemp is silent on the specific semiconductor (10) material and does not disclose that the first layer is a germanium material, gallium arsenide, aluminum nitride or indium intiminide (?). Pleshko teaches that known semiconductor materials include silicon, germanium or gallium arsenide (col.6,2-4). It would have been obvious to one of ordinary skill in the art that the semiconductor in the method of Kemp includes silicon, germanium or gallium arsenide because Pleshko teaches that these are known semiconductor materials.

Allowable Subject Matter

14. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest the method further comprising conditioning

Art Unit: 1756

the surface of the first layer with a third chemistry, wherein the conditioning causes the surface to a primarily the same atomic termini.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 571-272-1379. The examiner can normally be reached on Monday-Thursday (9AM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicole M Barreca
Primary Examiner
Art Unit 1756



7/14/05